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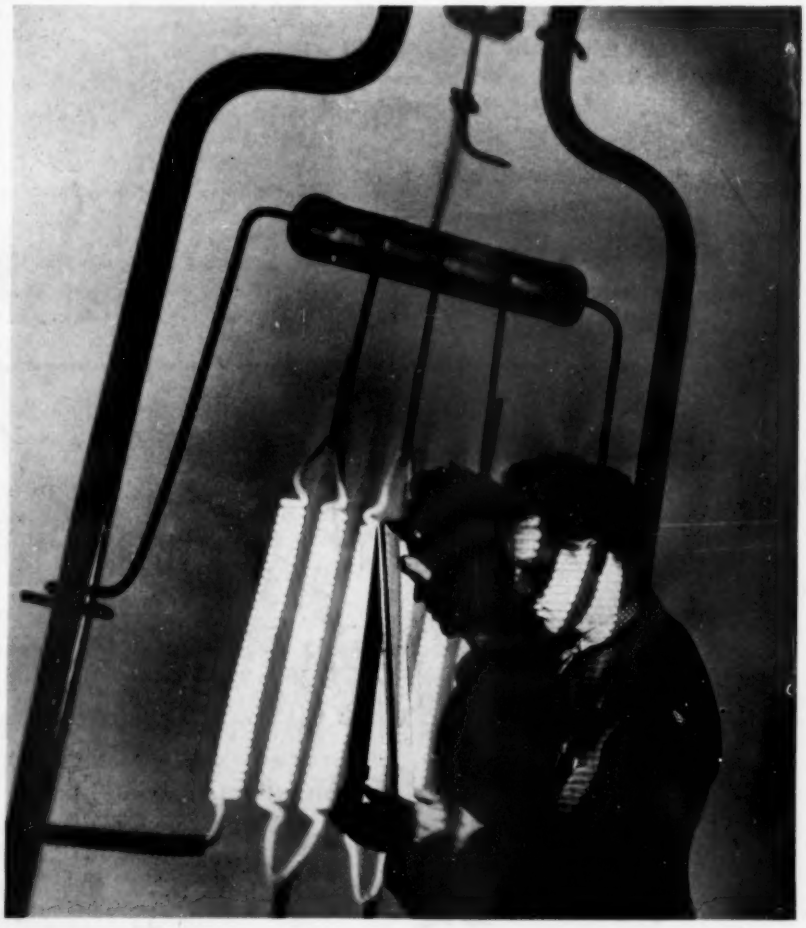
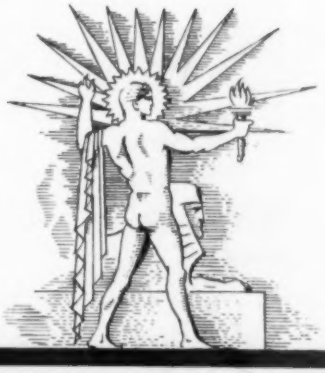
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





September 10, 1938

Finding Fault

See Page 169

A SCIENCE SERVICE PUBLICATION

Do You Know?

Grain and circus animals were the chief exports of north Africa during its Roman empire days.

The ship's surgeon on one trans-Atlantic liner says that injecting atropine is a quick remedy for seasickness.

A new telegraph system is capable of carrying 96 telegrams simultaneously in one direction over a single circuit.

Even though a wax film applied to vegetables is only one ten-thousandth of an inch thick, it reduces wilting.

Although copper coins are thought of as cheap, Sweden issued a copper in 1659 weighing 31 pounds and valued at $5.20.

The U. S. Forest Service has compiled maps showing the distribution of 170 species of forest trees in the United States.

The Egyptian word mummy comes from mumiya, meaning asphalt, because this material was used in preparing the bodies.

A farm psychology note: calves dislike eating out of a small box, and waste more feed that way than if fed from a big box.

Tea plants are grown for decorative purposes in South Carolina; the glossy leaves and white blossoms are very attractive.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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BACTERIOLOGY

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BIOLOGY

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TESTING

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ZOOLOGY

Of what use are beaver to woodpeckers? p. 174.

A giraffe's neck contains no more vertebrae than your own neck.

Malaria is blamed for over a million deaths in the British empire each year.

At Philadelphia's baby pet zoo, where children may play with small selected animals, the most popular pets are ordinary kittens and other domestic animals.

Unlike most fruits, oranges do not ripen further after they are picked.

Men in the CCC gain an average of six pounds during their first two months in camp.

A botanist says that in Central America more people are killed by falling trees loosened by rains than are killed by snakes.

SCIENCE NEWS LETTER

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AVIATION

Single-Seat Pursuit Plane Gives Way to Bigger Fighters

Greater Hitting Power Demanded of Craft to Combat New "Flying Fortresses"; To Carry Rapid-Fire Cannon

THE SINGLE-seat pursuit plane, romantic subject of tremendous tales of derring-do in World War days and later, has been doomed by the coming of giant multi-engined bombers such as Uncle Sam's "flying fortresses," Horace J. Alter, New York aeronautical engineer, declares. (*Army Ordnance,* Sept.-Oct.)

In its place, Mr. Alter predicts, is coming the multiplace fighting craft with a crew of seven men or more. That is the only type of plane, he indicates, powerful enough to knock down today's huge bombing planes and the bigger ones still to come.

Only such a plane, fitted with more than one high-performance engine and armed to the teeth with heavy guns that can deal out real punishment, is a match for the "flying fortress." Single-seat or two-place planes, with their necessarily limited armament, cannot do enough damage to today's all-metal, heavily built bombers to bring them down, he asserts. It takes highly concentrated fire of heavy bullets for a relatively long period of time, rather than a single chance shot, to knock out of the sky a plane such as the "flying fortress."

Radial System's Limit

The end of the era of dominance of the great radial air-cooled engines, which have reached their highest development in the United States, is also foreseen by Mr. Alter. "As the diameter of the radial engine increases, more of the horsepower is used in overcoming the resistance of the engine itself, until a point is reached at which no matter how many engines are added, no increase of speed is obtainable."

Liquid-cooled in-line engines, with small cross-section area and therefore small aerodynamic resistance, or Diesel engines of compact design, will take their place, he predicts.

Detailing specifications for the multiplace fighter he envisions, Mr. Alter asserts that it will most likely have at least seven men in its crew, so that its fighting mission can be carried out even if some of its men are disabled. It will have a supercharged cabin divided into air-tight compartments to enable high altitude fighting and to minimize the effects on its crew of damage done to one portion of the plane.

Powerful fore-and-aft fire from rapid-fire cannon will feature its armament. It will have sufficient range so as to be able to cruise around for several hours on the lookout for hostile craft and still have enough gasoline left to give any such plane it encounters a solid argument.

Although Mr. Alter does not so state specifically, the U. S. Army Air Corps has already taken a long step toward realization of such a design. The Bell XFM-1 Fighter, known better as the "Airacuda," is a heavily-armed fighting craft fitted with two 1,000-horsepower Allison liquid-cooled in-line engines and carries a crew of five. Its fighting ceiling is well over 20,000 feet. Army airmen admit that the "Airacuda" is the plane designed to bring down the "flying fortresses." Thirteen of this radically new type of ship are being built to Army order. An experimental unit of this plane has been in Army possession for more than a year.

Science News Letter, September 10, 1938

BIOLOGY

Goldfish Survive Brief Immersion in Liquid Air

TO SETTLE the long-disputed question, whether fish frozen in liquid air can "come to" again, Dr. Basile Luyet, of St. Louis University, has carried out a series of carefully controlled experiments, in which goldfish were immersed in the super-cold fluid for periods of from 10 to 60 seconds and then placed in water at ordinary room temperature.

Dr. Luyet sums up his results in three sentences:

"A goldfish completely frozen in liquid air is dead.

"A fish with its body walls partially frozen dies or survives according to the degree of damage to the tissues.

"A fish that has been frozen only superficially may become momentarily rigid but will regain its activity when it is re-warmed."

Science News Letter, September 10, 1938

BATTLE-CRUISER WITH WINGS

Fast, far-ranging, heavily armed, multi-gunned fighters of the "Airacuda" type are expected to replace the daring single-seater pursuit planes of war-time fame, now deemed too light to attack the enormous new heavy bombers now appearing in the world's air fleets.

BACTERIOLOGY

Synthetic Antigens Promise Revolution in Immunology

Use of Animals May Eventually Be Eliminated; Protection Stimulated With Chemical Compounds

A REVOLUTION in disease prevention methods, which may make unnecessary in future the use of horses or other animals for vaccine preparation, appeared in reports to the Society of American Bacteriologists at their San Francisco meeting.

Instead of shooting germs into horses, and using their blood for source of disease-fighting substances for human protection, scientists of the future may be able to confer this protection by chemical means.

One step in this direction is the preparation, apparently for the first time, of a synthetic "vaccine" which protects rabbits against pneumonia. This was reported by Dr. Walter F. Goebel, of the Hospital of the Rockefeller Institute for Medical Research. No human trials were reported, but these presumably will be made after further animal studies.

Against Streptococci

A similarly synthetic "vaccine," this time against streptococci, which are the germ causes of scarlet fever, childbed fever and other dangerous ailments, was reported by Prof. Stuart Mudd, of the University of Pennsylvania. This new type of vaccine was prepared by Drs. M. G. Sevag and D. B. Lackman, of the University of Pennsylvania.

These synthetic "vaccines," which technically should be called antigens, are chemicals. Ordinarily the germs produce such chemicals, and the body fights them off by producing other substances called antibodies. Dr. Goebel succeeded in preparing chemicals, without benefit of the germs, which call up the pneumonia antibodies just as the germ chemicals do. Drs. Sevag and Lackman obtained the chemicals from the streptococci or germs themselves. Such chemicals have been obtained from streptococci before, but never before in a state in which the chemicals had any practical, disease-protecting possibilities.

Another new pneumonia vaccine was reported by Dr. René J. Dubos, also of the Hospital of the Rockefeller Institute. This was prepared from pneumonia germs that had lost their disease-producing ability. Small amounts of this vaccine protect mice against one type of pneumonia only, but larger amounts give protection against others of the 32 types of pneumonia. No human trials were reported.

The value of animal charcoal as an aid in treatment of pneumonia appeared in the report of Dr. George E. Rockwell, of Cincinnati. The charcoal is injected into the veins in conjunction with anti-pneumonia serum. Of the 16 patients given this treatment by Dr. Rockwell, only one died. That was a man over 70, who developed acute heart failure.

A tiny amount of carbon or charcoal, Dr. Rockwell reported, saved the lives of mice that had been given fatal doses of pneumonia germs, even when the carbon was given as long as four hours after the pneumonia germs.

Dr. Rockwell emphasized that 16 cases are not enough on which to base final conclusions, but he believes his results suggest that charcoal should be used in treating pneumonia. He also emphasized that the charcoal aids but does not replace anti-pneumonia serum.

A hint that sulfanilamide, chemical remedy which has already proved successful in treating many cases of gonorrhea, may some day play a part as preventive of this widespread ailment appeared in the report of Drs. Grant Morrow and George Packer Berry, of the University of Rochester School of Medicine and Dentistry.

Only Hinted At

Sulfanilamide for prevention of gonorrhea was only hinted at and the Rochester scientists said nothing of such practical application of their research. They succeeded, however, in growing gonorrhea germs on the chorio-allantoic membrane of the chick embryo. This is an achievement in itself. The study of gonorrhea and search for a cure have been hampered heretofore by lack of any animal other than the human which is susceptible to the infection. With the germs of the ailment growing on the living tissues of chick embryos, scientists can now test various remedies, possible preventives of gonorrhea.

When a bit of the drug was dropped on the embryo 24 hours before inoculation with the gonorrhea germs, no infection occurred, Drs. Morrow and Berry reported. In other words, the drug prevented infection with gonorrhea germs. The drug "cured" the condition, eradicating the germs, in other embryos inoculated before the drug was given.

Doctors have already found sulfanilamide useful in treating gonorrhea, and many spectacular cures have been reported. The reason for its success as a remedy now appears to be its ability to act somewhat as an antitoxin, inactivating the so-called toxin of gonorrhea germs. This inactivation of gonococcal toxin was reported by Drs. C. M. Carpenter, G. M. Barbour and P. L. Hawley, of the University of Rochester School of Medicine and Dentistry.

Antitoxic Action

"Toxin" prepared from gonorrhea germs isolated from the knee joint of a patient suffering with gonococcal arthritis was injected into 116 mice. All these mice died. Then some of the "toxin" was mixed with sulfanilamide. Of 295 mice given this mixture, only one-fourth died. The others apparently were protected by the antitoxic action of the sulfanilamide.

Certain plant diseases caused by filterable viruses can be mistaken for the effects of heredity, Michael Shapovalov, pathologist of the U. S. Department of Agriculture, pointed out. They are transmitted from one generation to another by infection, just as faithfully as if they were hereditary traits carried by genes.

Some of their effects look astonishingly like those of the hereditary units. Thus, the effects of "shoestring" virus on tomatoes closely resemble those of the gene known as "wiry."

A test for disinfectants, which takes into account not only the germ-killing power of these agents but also their tendency to destroy or injure body tissues, was described by Dr. A. J. Salle, of the University of California. Collaborating with Dr. Salle in evolving the test were W. A. McOmie, I. L. Shechmeister and D. C. Foord.

Phenol or carbolic acid has heretofore been used as the standard for determining germ-killing powers of disinfectants. Comparing disinfectants with phenol, however, does not take into account the effects of possible injury to tissues.

When various germ-killers were tested by the new method, iodine and some of the chlorine compounds rated highest.

PATHOLOGY

Filter-Passing Pathogen Found in Brains of Mice

A NEW disease-causing agent, seemingly related to the filter-passing viruses but different from them in some respects, has been isolated from the diseased brains of mice at the Rockefeller Institution for Medical Research by Dr. Albert B. Sabin. (*Science*, Aug. 26)

The new disease cause was found associated with a large one-celled parasitic animal form known as toxoplasma. Its discovery was partly the result of accident, when a culture of toxoplasma was unintentionally killed by freezing at the low temperature of 80 degrees below zero Centigrade. A fluid separated from the dead toxoplasma was still able to cause the disease, destroying nervous and other tissues when injected into them. It could be passed from mouse to mouse, like a filterable virus, but it does not spread at all by natural means.

Like the better known filterable viruses, it can pass through the pores of some types of fine-grained porcelain filters. Other, smaller-pored filters, however, will stop it. By these and other means the diameter of its "elementary bodies" was estimated at about the wavelength of the lower brackets of ultraviolet light.

By most ordinary microscopic methods it is invisible, but under special staining treatment some exceedingly minute ring-shaped or oval objects were detected under high magnification. There were also occasional larger rings, triangles, and quadrangles.

How this disease agent spreads is still a mystery. It cannot spread by itself or be carried by an insect, so far as can be told at present. It may imaginably be carried by the toxoplasma organism, but that only pushes the mystery back a step: How does the toxoplasma get about?

Any ultimate decision, Dr. Sabin states in conclusion, "must be postponed until further opportunity is given other investigators as well as ourselves to determine whether or not it may occur spontaneously in mice under conditions other than infection with toxoplasma."

Science News Letter, September 10, 1938

GENERAL SCIENCE

Scientist Has Plan to Salvage "Lost" Research

EVERY college and university in America should profit by the new proposals now being made to salvage "lost" research in the sciences. Out of the plan science, and America, should profit.

In many colleges of the nation heavy teaching burdens and lack of equipment prevent good research men from undertaking creative research which, by training, they are capable of doing. The work these men might do is "lost" research. Dr. J. C. Boyce, of Massachusetts Institute of Technology, has a plan which would salvage some of it.

Dr. Boyce proposes that the universities and larger colleges should "farm out," as it were, some of the many minor problems which arise as part of their general broad research programs. Many of these problems would seem to be trivial and uninteresting if tackled singly but when pursued as part of a larger and broader research endeavor they take on new meaning and disclose significant findings.

Such problems would give a stimulus to men who now may form one-man departments in small colleges. They could be carried out in several ways: During summer school sessions or on sabbatical leave; or in the larger university laboratories where there is close geographical linkage; or finally, by the loan of research equipment to the smaller institution for the joint investigation. In general it would seem best to Dr. Boyce to have the experimental work carried out in the larger institution and the data examined and worked over in the smaller. Writing in the *Review of Scientific Instruments*, Dr. Boyce sees benefits to all by his plan.

Science News Letter, September 10, 1938

SHELL-MATES

Sharing the same house of shell, these "Siamesed" turtles have two independent heads and two tails, but only four legs. The stub projecting between the heads appears to represent a suppressed foreleg, or perhaps two of them.

BIOLOGY

Siamese Twin Turtles Rare, But Interesting

SIAMESE twins are not confined to the human species by any manner of means. Turtles have 'em, too. They range in Siameseness all the way from being two animals joined at some point at the sides or fronts of their shells to just having two heads on one neck, with all the rest an apparently normal turtle body, ambling around as usual on four stubby legs.

The one shown in the accompanying illustration represents more or less of an intermediate condition. The little reptile had two heads and two tails, but any extra legs that may have got started on the joined-together sides are represented only by the stub between the heads, which is presumably the rudiment of one or both front legs.

Presumably there are two bodies, at least partly independent of each other, within the shell, for the shell structure is somewhat abnormal. It is not simply an unusually wide single shell, nor yet is it two shells joined together; it has features that suggest both conditions.

It will be noticed that the right-hand turtle twin is somewhat smaller than its

shell-mate. Presumably they started out evenly, but one of them may have dominated the other, Dr. Samuel F. Hildebrand, of the U. S. Bureau of Fisheries, who discusses turtle twins in the *Journal of Heredity* (Sept.) states that even turtles that are thus compelled to live side by side in the same house will frequently fight over morsels of food.

Turtle twins are known from all over the world, yet they seem to be comparatively rare. At one station of the Bureau of Fisheries, the hatchery in Beaufort, N. C., there are records of 100,000 young terrapins emerging from the shell, over a period of 25 years; yet only two cases of these conjoined twins have been observed.

Science News Letter, September 10, 1938

Chemistry

Synthetic Fertility Vitamin To Be Given Clinical Tests

American Chemical Society Hears Reports on New Drugs, Medicinal Value of Onions, and Gasoline From Coal

SYNTHESIS of the anti-sterility vitamin E is now an accomplished fact, and science stands on the threshold of being able to prove one way or the other whether certain kinds of human and animal sterility can be cured by feeding this vitamin E in the diet. At the meeting of the American Chemical Society in Milwaukee, the methods used in the laboratory creation of this important vitamin were described in a report by seven University of Minnesota chemists.

Lack Causes Sterility

Vitamin E is the factor in the diet whose absence has been proved to cause sterility in experimental animals, such as rats. It was originally discovered by Dr. Herbert M. Evans, of the University of California, in research begun some 16 years ago.

Ever since its discovery there has been much research seeking definite proof that the absence of this vitamin caused sterility in the larger, domesticated animals and even in man. Through the years studies with animals have shown evidence pro and con for this view. And there has grown up the suspicion, not yet confirmed clinically, that vitamin E—the so-called "essence of fertility"—might aid in certain types of human sterility.

Early in the present year, the Swiss scientist Dr. P. Karrer, and his associates, H. Fritzsche, B. H. Ringier, and H. Salomon, reported the synthesis of alpha tocopherol, a chemical apparently identical with vitamin E. Swiftly following, American scientists, banded together from three institutions, likewise reported synthesis of the vitamin.

Members of the department of chemistry at the University of Minnesota, who did the chemical side of the synthesis program, described the technical steps in its production. These scientists were Prof. Lee Irvin Smith, H. E. Ungnade, W. W. Prichard, J. W. Opie, S. Wawzonek, F. L. Austin and H. H. Hoehn. Cooperating in other phases of the work were Drs. Herbert M. Evans, Gladys A. Emerson and Oliver H. Emerson, of the University of California and Merck and Company.

In proving the effect on sterility of alpha tocopherol, the Minnesota chemists' report cited experiments in which sterile rats, lacking vitamin E in their controlled diet, were given doses as small as three milligrams of the chemical vitamin E and restored to fertility. Human tests have not yet been undertaken but are expected to be launched now that sizable supplies of the synthetic vitamin can be made.

Sedatives and Hypnotics

New sedatives and powerful sleep-producing drugs which do not harm the animal body have been developed by Bryn Mawr College chemists. The new drugs are a further step toward the long-sought goal of chemistry of finding a potent but harmless and non-habit forming drug to replace morphine, said Drs. Arthur C. Cope and Evelyn M. Hancock in presenting their report.

Many sleep-producing drugs have been derived in the past from barbituric acid derivatives but ordinary methods failed to create one special type; a class in which vinyl groups were attached to the barbituric molecule. The barbiturate sedative drugs as a type are not considered habit-forming, at least in the creation of drug addiction. The Bryn Mawr chemists, however, have now solved the problem by special methods and have created over 40 new vinyl barbituric acid compounds. Several of these are effective in low dosage and are relatively non-toxic when applied to experimental animals. The new compounds produce either brief, moderate or long sleep, according to their chemical structure.

Synthetic Ephedrine

Research may soon free America and the rest of the world of dependence on a small area of China for its supply of ephedrine, the powerful alkaloid drug used in cases of low blood pressure and as an astringent nasal spraying agent, it was also reported at the meeting. Dr. Jonas Kamlet, of Israel Zion Hospital, New York City, described researches seeking the production of the drug synthetically.

Heretofore, he pointed out, the world's supply of ephedrine has come from the ma huang shrub, grown in a small area near Tientsin, China. This area was one of the first to be taken by the Japanese in their undeclared Chinese war and the supplies of the drug were stopped. The price, for a time, skyrocketed. Efforts to grow ma huang in other parts of the world are not notably successful.

Cost Still Excessive

Small amounts of ephedrine and its derivatives can now be produced in the laboratory, Dr. Kamlet reported, as he described a simplified method for its production. The synthetic ephedrine is identical with the natural variety but its cost is excessive. However, if the world's supplies were cut off, chemistry could come to the aid of medicine.

Grandmother's remedy of eating raw onions to cure a cold may not have been just superstition after all. The vapors of onions, that for centuries have made people cry, have the power to kill germs. E. F. Kohman, chemist of the Campbell Soup Company, told his colleagues of his research on the chemicals which onions liberate as their lachrymal agent. They are the potent aldehyde family of compounds. Most familiar of the aldehydes is formaldehyde, used in preserving biological and medical specimens and as a germicidal agent.

The U. S. Bureau of Mines' Pittsburgh plant for converting coal into petroleum is now able to obtain from 70 to 75 per cent. yields of oil convertible to gasoline, it was reported by an eight-

man team of government scientists.

Thus, potentially, the Pittsburgh area of the coal mining region could produce some 12,000,000,000 tons of oil that could be made into gasoline if the time ever comes when it is needed. This estimate is based on the best and latest calculation of the amount of recoverable coal in the Pittsburgh coal bed, which is placed at about 16,020,000,000 tons.

In a small, experimental plant at Pittsburgh, having a capacity of 100 pounds of coal a day, the U. S. Bureau of Mines chemists are taking coal in the powder form, mixing it with heavy oil, squeezing it to pressures of over 3,000 pounds to the square inch and heating it to 824 degrees Fahrenheit. Under the heat and pressure, extra hydrogen atoms are added to the coal molecules. Out of the treatment comes an oil suitable for conversion into gasoline.

The report on the percentage yields of coal from Pittsburgh seam coal was prepared by Dr. H. H. Storch, Dr. L. L. Hirst, C. O. Hawk, R. L. Boyer, P. L. Golden, I. I. Pinkel, J. R. Schaeffer, and R. H. Kallenberger. The work at the Pittsburgh hydrogenation plant is directed by Drs. Hirst and Storch, under the general supervision of Dr. A. C. Fieldner, chief of the technologic branch of the U. S. Bureau of Mines.

Science News Letter, September 10, 1938

GEOGRAPHY

New-Found Alaska Ice Field Covers Immense Territory

ICE AGE in the Twentieth Century: that is what the Alaska glacier field discovered by the Harvard University-National Geographic Society Expedition turns out to be. It is the largest non-polar ice cap on earth—a latter day piece of the Pleistocene. It stretches over a distance of 235 miles, or as far as from Washington to New York.

It has never been seen before because it is cupped in a vast nest of mountains which include some of the loftiest and most difficult peaks in North America. Only the coming of age of the airplane as an instrument of exploration has made its discovery possible.

Science News Letter, September 10, 1938

• Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.

ARCHAEOLOGY

Find One-God Pharaoh In Strange Company

BRITISH archaeologists, digging at an ancient fort-town called Sesebi in Egypt, recently unearthed three temples. In depths of one, they entered a crypt. On the walls they found some extraordinary paintings of Pharaoh Akhnaton.

There sits Akhnaton keeping company with Egypt's god of immortality, Osiris. In another scene he poses with Geb, god of earth. Farther on, he amiably sits with more gods.

If this were some other Pharaoh, it might be commonplace. But Akhnaton is famed in history as the religious reformer who swept out Egypt's legion of specialized gods, and proclaimed one god.

Defying Egypt's most powerful priests, Akhnaton worshiped a god formless and eternal, but showing himself to his children in the golden sun disk and life-giving rays of sunlight.

It was a religious revolution, no less. The idealistic king built a brand new capital city down the Nile at El-Amarna. In roofless shrines, his court worshiped the sun.

To find this king consorting with various gods is, therefore, an unusual sight. The explanation, of course, is that the temples date from early in his reign, about 1370 B. C., before he broke with the old faith.

Akhnaton even dedicated the temples at Sesebi to the old gods, for cornerstone deposits have been found. They bear the name he used at the start of his reign—Amenhotep IV. Since that name honored Amen, the god he most hated, he naturally took another when the upheaval came.

The temples unfold an early chapter in Akhnaton's career. But we will never know the most interesting thing of all: what the young king thought when he dedicated those temples, and inspected his portraits taken with the old gods.

Science News Letter, September 10, 1938

ARCHAEOLOGY

Exploring Is Slow in Ancient Land of Sheba

HOW VERY little the world knows about Southwest Arabia is emphasized by the recent journey across it from the Red Sea to the Indian Ocean by the British explorer H. S. Philby.

Here is presumably the land ruled by that romantic lady, the Queen of Sheba. The Queen's fabulous wealth and her visit to King Solomon are familiar enough after 3,000 years to figure in crossword puzzles and quiz games. And yet her cities, palaces, and even documentary proof of her existence remain to be dug out. Arab resistance to intrusion of foreigners remains a barrier to systematic programs of digging such as archaeologists like to plan in order to restore the ancient history of a region.

Meanwhile, Mr. Philby has made discoveries which many people would have supposed were commonplace knowledge. All of Arabia, for example, has been credited with having only one river worth the name. But he saw half a dozen rivers flowing continually from lofty sources in this darkest—that is least known—corner of Arabia.

Arabia's most beautiful oasis has heretofore been unknown, also, or practically so. Najran, in Mr. Philby's estimation, deserves the highest praise for beauty. He spent two weeks at Najran. One foreigner had been there before him—a Frenchman in 1869. Castle ruins mark a great city there, awaiting archaeological explorations.

Even the Arab steed has been misunderstood, it may be, for the explorer paused at many inscribed rocks to copy the writings and sketchy pictures. And he was struck by the pictures of fighting men and hunters mounted on horses.

These records he has turned over to experts. But he hazards a guess that horses came to Arabia long before the sixth century A. D., which was the earliest time for their appearance that old literary sources definitely proved.

Science News Letter, August 27, 1938

CHEMISTRY

Heavy Nitrogen Isotope Being Made in Quantity

OUT OF great tubes of glass longer than the width of five city lots, Columbia University scientists are producing quantities of heavy nitrogen isotope which are sufficient to supply many of the nation's laboratories with this hitherto rare gas.

Under direction of Prof. Harold C. Urey, Nobel prize winner of 1934 for his discovery of heavy hydrogen, Dr. Harry G. Thode has designed the new "factory" for the heavy nitrogen isotope. The device consists of 170 feet of glass column housed in three sections in the chemistry laboratory.

Starting the gas containing heavy nitrogen only to the concentration of four-tenths of one per cent., the Columbia scientists are able to produce each 24 hours about two grams of heavy nitrogen having a concentration of over 70 per cent. This recovery is equivalent to about three quarts of heavy nitrogen a day.

With these relatively large amounts of heavy nitrogen now being made, physicists and chemists in many laboratories will be able to extend greatly their research on the structure of atoms and molecules and be able, further, to use larger quantities of heavy nitrogen atoms as "tags" by which the intricate and little-understood processes of the animals and human body can be fathomed.

The same equipment can also be used to concentrate the heavy sulfur isotope of mass 34 and the heavy carbon isotope of mass 13.

Science News Letter, September 10, 1938

AGRICULTURE

Guerillas Blast Japan's Hopes for Cotton Crop

COTTON crop control in the U. S. A. is child's play compared to what is happening in the four Japanese-held provinces of North China. The guerilla government of these provinces, maintained in defiance of the army of occupation, has blasted Japanese hopes of using the conquered territory as a great reservoir of raw cotton, to free the home mills of dependence on American and other overseas sources.

The seriousness of the situation is disclosed in a report to the *Far Eastern Survey,* published in New York. The authority of the Japanese, as is now fairly evident, extends exactly to the limits of range of Japanese guns. As soon as the soldiers' backs are turned, the peasants yield obedience and cooperation to the mandates of the "underground" guerilla government.

This unofficial but effectual organization last year permitted farmers in the occupied regions to export the crop they had already planted, to get some ready cash. This year the orders went forth to raise only one-tenth as much cotton as they did in 1937—and the supply which Japanese mill owners counted on vanished at its source. Instead, the farmers were instructed to plant grain for food, and the wheat crop, favored by good rains, is the largest in years.

Yet even this appears to be largely unavailable to the Japanese invaders. The farmers are reported to be boycotting the Japanese-controlled railway towns, necessitating the importation to such towns of Manchurian or Australian wheat. Wheat from the latter source has to be paid for, of course, either out of Japan's dwindling gold reserve or by exports of manufactured goods.

Although the guerillas are careful not to harm or offend the farmers who cooperate with them, they have no such tenderness toward such concentrated economic targets as coal mines, iron mines, and salt beds that have been seized by the enemy. Wherever they are able, they diversify their program of hazing Japanese troop detachments and supply trains by attacking and destroying these mining plants.

Science News Letter, September 10, 1938

PHYSICS

A. Cressy Morrison Prizes For 1938 Are Announced

DO EXPLODING atoms keep the stars glowing?

This question, one of the outstanding riddles of modern physics, has been put before the scientific world with a $500 prize to heighten interest in getting (or at least attempting) an answer. The New York Academy of Sciences has announced an essay contest, to be closed Nov. 1, the best paper to receive the A. Cressy Morrison Prize of $500.

In addition to this prize, competition for which is open to all, there are two other A. Cressy Morrison Prizes of $200 each, which are open only to members of the Academy, including new members who join before the Nov. 1 closing date. Essays for these competitions are to be on "a scientific subject included within the field of the New York Academy of Sciences and its affiliated Societies."

Science News Letter, September 10, 1938

IN SCIENCE

PLANT PHYSIOLOGY

Heteroauxin Promotes Growth Through Injury

SUPPOSED to be a substance promoting growth in plants, the chemical known as heteroauxin has exactly the opposite effect of inhibiting their growth. But at the same time, if not so concentrated that it actually poisons the cells, it stimulates them to produce true growth-promoting substances of their own, to repair the damage that the heteroauxin has done.

These conclusions are derived from experiments on yeast cell cultures conducted by Prof. John R. Loofbourow and Sister Cecilia Marie Dwyer, S.C., at the Institutum Divi Thomae, Cincinnati. (*Science,* Aug. 26.)

The two experimenters used a technique which had previously been employed at the Institutum to demonstrate that when a cell is injured, as by ultraviolet radiation, it produces a growth-promoting substance or auxin. Addition of heteroauxin produced similar injurious effects, and stimulated auxin production in the same way.

The present experiments give strong support to similar researches conducted at the University of West Virginia by Prof. Leon H. Leonian and Dr. Virgil Greene Lilly, who worked on fungi and other lower plant forms.

Science News Letter, September 10, 1938

CYTOLOGY

Medal To be Awarded For Paper on Cell Theory

A MEDAL will be awarded by the Mexican Society of Natural History for the best essay on the cell theory or a related topic to be submitted before Jan. 31, 1939, it is announced by Dr. M. Martínez Báez, president of the organization. All essays submitted in the contest are to be published in a special memorial volume commemorating the hundredth anniversary of the formulation of the cell theory by the German scientists Mathias Jacob Schleiden and Theodor Schwann.

Science News Letter, September 10, 1938

NCE FIELDS

ASTRONOMY

Two New Satellites of Jupiter Are Discovered

SATELLITES numbers 10 and 11 have been discovered for the planet Jupiter by Dr. Seth Nicholson, using the 100-inch reflector of the Mount Wilson Observatory. Dr. Nicholson was at work on the project from July 6 to Aug. 25.

He also observed the ninth satellite, which has been unseen for ten years. Dr. Nicholson discovered this satellite in 1914. With three Jovian moons to his credit, he is runner-up in this field to Galileo, who observed satellites numbers 1 to 4, in 1610.

Science News Letter, September 10, 1938

ARCHAEOLOGY

Stone Age Hunters' Camp In North Germany Explored

HUNTERS' life in northern Germany while Ice Age glaciers still blocked the Baltic and lay over the whole of Scandinavia and most of Russia has been pictured with considerable accuracy by a cooperative scientific team of archaeologists and botanists under the leadership of Dr. Alfred Rust of Hamburg.

The study was conducted in what is now a low meadow about 13 kilometers northeast of Hamburg. Just after the ice sheet had retreated, the meadow was an Arctic tundra, and in it was a small lake. Chance finds of Old Stone Age implements hinted that there had been a paleolithic hunters' camp thereabouts.

Dr. Rust made test digs to locate the suspected extinct lake, for he figured that the hunters would have had their camp near it. Presently he found the ancient bottom deposits. More extensive excavations uncovered the campsite, with numerous weapons, tools and other artifacts of horn and bone, as well as great quantities of bones representing the hunters' quarry.

The men were primarily reindeer hunters, the remains all indicate. They used bows made of reindeer horn, and round-pointed arrows tipped with bone or antler, not with flint. There is no evidence that they possessed either dogs or sleds, as modern Arctic tribes all have. Other bones show that the hunters also knew horse, fox, rabbit, wolverene, badger, and several kinds of waterfowl.

The reindeer they hunted were not those of Arctic Europe of today, but rather resemble the species of northeastern Siberia and Arctic North America, known as the caribou. Furthermore, condition of bones and antlers shows that the hunters were there only during the summer. They were apparently nomads; there is some suggestion that they may have wintered in Moravia and Ukrainia.

Studies by the botanists of the expedition, especially on the pollens embedded in the peat and muck deposits, date the campsite at about 20,000 years ago. The type of implements corresponds to the culture known elsewhere as Magdalenian. The age in years of this Stone Age culture has not previously been known with anything like accuracy.

Science News Letter, September 10, 1938

ENGINEERING

Army Engineers Study New Concrete Fortification

U. S. ARMY engineers, who witnessed in Washington the demonstration of a new method of constructing a concrete shelter, said to be bomb- and shell-proof, within a few hours after pouring of the concrete, are studying their notes and data to check on the inventor's claims and determine the place of the method in national defense.

No test shelling of a sample structure at a place such as Aberdeen Proving Ground is contemplated, the War Department stated, as sufficient data was gathered from study of the sample structure standing on the grounds of the National Bureau of Standards.

Invented by Karl P. Billner, a New York inventor, the method uses vacuum pumps to remove excess water from the concrete and so shorten its setting time. In addition, the vacuum inside the pouring forms and air pressure outside combine to compact the material. Comparison of the cost of the new method with that of standard methods is difficult because, although more machinery is required, less labor is needed.

No widespread application to American national defense is anticipated, however, since, after all, the United States has not yet experienced any need for heavy fortifications similar to those in Europe. If the method wins Army approval, notice of that fact will be made for use when the occasion requires.

Science News Letter, September 10, 1938

AVIATION

Device Thumps Pilot's Foot If He Forgets Landing Gear

A WARNING signal that automatically thumps the pilot's foot if the plane's landing gear is not in landing position when the engine is throttled down preparatory to landing, has been patented by Clinton W. Howard of Washington, D. C., and Harold L. Carpenter of Dayton, Ohio.

Covered by Patent No. 2,128,250, granted with the proviso that the United States government is entitled to its use without payment of royalty, the invention is designed to prevent landings with retracted gear. Although such landings are in most cases executed safely, they still damage the belly of the ship.

The invention was made, the letters patent reveal, with the requirements of modern high speed military aircraft in mind. In them the maze of instruments and the roar of the engines are such that the pilot's customary alertness is somewhat dulled on occasion to aural and visual signals, with the result that he sometimes attempts to land with landing gear up.

The warning device consists of an auxiliary tread attached to the rudder and brake pedals. When the landing gear is in landing position, an electrical circuit is broken. It is likewise open when the throttle is in such a position that the engines are delivering sufficient power to keep the plane in full flight. But if the wheels are up in "flight position" and the throttle is not opened wide enough, the electrical circuit is closed. This sets into operation a small solenoid motor that literally raps the soles of the pilot's feet.

Science News Letter, September 10, 1938

ENGINEERING

Image Projected on Wall Aids Lamp Improvement

See Front Cover

OLD-TIME movie projector lamps used to go out at crucial times because, for one reason, the coiled-coil filament of a 1,000-watt lamp would buckle and break if it didn't have room to expand and contract. That doesn't happen any longer. Now, by projecting the image of the filament many times enlarged on a wall, electrical engineers can measure with a ruler the exact amount of expansion and contraction and make allowances accordingly in the construction of the bulb.

Science News Letter, September 10, 1938

TESTING

Wearing Things Out

National Bureau of Standards Scientists Destroy All Manner of Things—To See How Good They Are

By LEONARD H. ENGEL

UNCLE SAM's hired hands have been scientifically and systematically wearing things out for many years now, entirely on purpose. This time it isn't the patience of government critics, either, that has been getting the wear and tear.

In one of the greatest long-range testing programs ever developed, scientists and technicians in the sprawling laboratories of the National Bureau of Standards in Washington have been putting all manner of goods and materials through use and abuse to see what they can take and which is best.

Paint to mark the center lines of highways has been worn to the point of disappearance by a rubber-shod wheel that has traveled many thousands of miles without ever getting anywhere. Iron-wheeled trucks have worn ruts into a dozen varieties of flooring material. Paints have been subjected to weathering tests that equal in one month a year's exposure to the elements. A whole host of things have been deliberately worn to the breaking point.

No estimate is possible of the amount of money that has been spent over a period of years on the Bureau's now famous simulated service tests, but it runs into millions, even though the Bureau's total appropriation is just under two million dollars a year today and was formerly much less.

Many Millions Saved

But no matter exactly how many millions have been spent on the tests, they have saved untold millions more through raising standards generally and through serving their original aim—guidance of purchases by the Federal government. Uncle Sam is by far the nation's biggest purchaser of consumers' goods. Hundreds of articles, used regularly by the different agencies of the United States, are purchased today on the basis of rigid performance specifications drawn up by Bureau of Standards scientists.

Dozens of machines have been built by Bureau engineers to carry out this work. Among the best known is the machine developed several years ago at the instance of the General Federation of Women's Clubs to duplicate in scientific fashion the effect of wear on women's silk stockings.

Stockings were expanded and then allowed to "relax" just as they do from the natural movement of a human knee in walking. The machine in a short time gave accurate, reliable information that has gone far to standardize a once chaotic industry. So successful has this machine been that it has been marketed by a private company for use by the manufacturers.

Wearing Carpets Thin

Testing programs are carried out in nearly every one of the Bureau's sections. Paints and varnishes are the special care of one section. The Bureau's textile section has worn carpets thin, silk dresses have been worn until they failed and then Bureau scientists have analyzed them to learn why, gloves have been used to the end of their lives, silks have been subjected to severe aging tests. Windows have been raised and lowered until the window sash cord just gave up and broke. The service to be expected from wool textiles has been carefully determined.

Two types of test have been generally employed—the test that quickly "ages" a given product to determine not only its life under normal conditions, but why it fails when it does; and simulated service tests which put goods through a machine routine that not only comes close to duplicating conditions encountered in real life, but does it with scientific accuracy and in a much shorter period of time.

Both types of tests are essentially modifications of the test to determine performance; in insistence on the fact that performance must be the criterion the bureau, headed by Dr. Lyman J. Briggs, and its staff of some 840 men and women, have played a leading role in the gradual recognition of this truth throughout American industry.

"The really essential qualities of a product cannot be determined from mere inspection," declares a publication of the Department of Commerce, of which the Bureau of Standards is a part. "Laboratory research is necessary which sometimes involves months or even years of work. The method used in testing must likewise be developed with much care. Accelerated tests are necessary in many instances, which is one of the most difficult phases of commodity testing.

Yet while keeping a healthy, scientific skepticism of the accuracy of its own work, the Bureau has still gone far.

Industry Benefited

The whole program of wearing things out on purpose is not by any means an isolated project in itself. It fits into the general purpose of the Bureau and was actually begun in order to prepare specifications for purchases by the Federal government, still one of its major jobs. Yet in carrying out this purpose it has directly benefitted industry and the consumer alike in several ways.

Prior to work by the Bureau, standard specifications, standard ways of describing commodities, did not exist within many fields. Silk stockings appeared under a bewildering variety of descriptions, to the confusion of consumer and manufacturer alike and certainly to the disadvantage of the former. The studies of the Bureau and their systematic wearing out of hundreds of pairs of dainty, sheer hose have resulted in establishment of a small number of standard grades and a general raising of quality throughout the whole industry.

Consumers' Commodities

Much of the Bureau's standardization work has been concentrated in the field of consumers' commodities because of the absence generally of technical bodies which have drawn up suitable standards in other fields. Boiler performance standards, for example, are looked into carefully by a committee of the American Society of Mechanical Engineers. But such groups too often do not exist or carry out such a function in the case of materials sold in small lot orders to the general public.

Great progress has been made in the United States generally in the field of standardization, bearer of mass production's low prices. Outside the Bureau the most important group is the American Standards Association, which frequently cooperates with the men in the Bureau's neatly kept plant.

True enough it is that brand names

of tested products are not available except to the government agencies concerned. But, a spokesman for the Bureau explains, a reason for that is the fact that if any comparative list were published, it would be out of date the day after it was compiled because manufacturers down at the bottom of the quality list would quickly alter their product. And, to be entirely accurate, (a passion among the busy scientists in Bureau employ) the list would then have to be revised. But the process becomes endless—and increasingly expensive.

Building a machine to wear something out is by no means a simple procedure, for the machine must duplicate the wear the commodity receives in actual service.

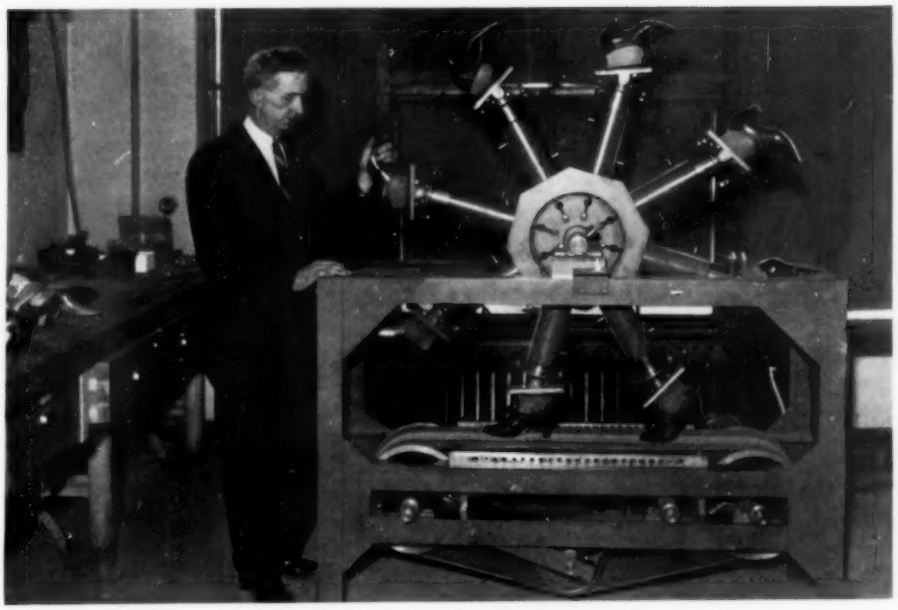
Machine Walks Floors

Are you testing flooring materials for houses? Very well then, a machine that walks on the floors in much the same way as you and I, only tirelessly, must be built.

There is such a machine at work today. It has been set to work as part of a $200,000 testing program on low-cost housing materials. The program was launched almost a year ago by a special act of Congress as one of Uncle Sam's contributions to the new push toward low-cost housing and is under the direction of Dr. Henry L. Dryden. It is currently the largest single program of the Bureau.

A leather-shod wheel moves endlessly around a circular track on a floor consisting of many sections, each made of a different material. It presses down on the vari-sectioned floor with the weight of a man. New materials as well as old are being put to test in order to enable comparison between old standbys and the newer, often synthetic products of American laboratories.

Shoe leather has been rigorously tested in another wheel device, partially at the instance of the Post Office Department working through the Treasury's Procurement Division, which does much of Uncle Sam's buying. Postmen do more walking than even the cop on the beat, and shoes make up a sizeable item in the Post Office budget. Poor shoe leather that wears out quickly can pile up an enormous amount of waste over a period of years.



BOOTS, BOOTS, BOOTS, BOOTS!

E. L. Wallace, of the Leather Section, demonstrates this walking machine which tests the uppers of shoes. The wheel and the endless track go around and the shoe gets the same kind of flexing treatment it receives every time a person makes a step. Scientists of the Bureau are studying with its aid not only shoe quality, but different types of shoe construction.

Paint-aging machines are something uncomfortable to look at, particularly if you don't have smoked glasses along. For in each machine, essentially a drum which rotates slowly, is a powerful lamp giving off light that is as close an approximation to sunlight as possible. Light has a deleterious influence on paint; so the super-bright exposure brings out the defects in a relative hurry, one month of wear here equaling a year outdoors. In addition, the paint samples that line the drum are tortured by heat and drenched with water representing rain.

An even more severe weathering test is the lot of brick walls being put through the mill as still another part of the housing program. Fierce "storms"—water sprays shot at the walls by a forty-mile-an-hour gale whipped up by electric fans—beat upon them continuously. Whitewash on the other side of the wall betrays the slightest leak with a telltale stain. Meanwhile, records kept by the careful scientists tell them exactly how long elapsed between the beginning and the end of this treatment.

Much of the Bureau's work has been carried out at the request of non-government organizations. In addition to the studies of stockings, the General Federation of Women's Clubs had the Bureau carry out a similar study of gloves. The same group is aiding research to determine what kind of shoe uppers are best; for this job a spoked wheel, each spoke with a shoe fitted on it, turns ceaselessly on a moving tread with the shoes flexing and unflexing as they do every time a wearer takes a step. Silk dresses were critically examined in cooperation with the American Home Economics Association.

Other commodities tested in the widely-varying Bureau activities include garden hose, insulating material, special fuel "dopes" to improve the quality of gasoline, paper used for permanent records and a wide variety of other purposes. It was the Bureau that discovered that some paper towels lose a part of their ability to absorb water after a few months' storage. Tires and brake linings, both of interest to a government that uses an enormous number of motor vehicles for its armed forces and other services, have been systematically tested to the wearing-out point for years.

But though the wear-testing and the simulated service test are major portions of the National Bureau of Standards' activities and have attracted their share of attention, they constitute by no means

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenter:

Monday, Aug. 29, 10:22.2 a. m., E.S.T.

Philippine Islands, southeast of Manila. Latitude 12 degrees north, longitude 124 degrees east.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL August 13.

the Bureau's entire roster of activities. Fundamental research is being carried on there, 365 days a year. Two Bureau scientists were the men who worked out the details of what a blind landing system for airplanes must do, for example —and incidentally, devised many of the devices that will soon be used with such systems. Other scientists have added materially to the chemist's knowledge of textile fibers.

The list of Bureau research achievements is long and brilliant. And the Bureau is still the keeper of standard weights and measures for the United States of America; it has not forgotten one of the primary purposes for which it was established by act of Congress in 1901.

Science News Letter, September 10, 1938

For the third time, Ossetian people of the Central Caucasus have acquired a new alphabet: they used an Arabic alphabet before the revolution, then the Latin, and now have one based on the Russian.

LIGHTS THAT MUST FAIL

The Bureau tests Uncle Sam's electric light bulbs by checking a random selection from the many hundreds of thousands of bulbs bought to light Federal offices throughout the country. If they do not meet specifications set by Bureau scientists, back they go to the manufacturer.

PSYCHIATRY

Mind of Society Needs To Call in the Doctor

SCIENTISTS recognize the right of society to be protected from those who prey upon their fellows. Criminals should be segregated where they cannot do harm. But prison incarceration as a cure for the habitual criminal is not supported by scientific research.

For the normal child, punishment may have its value in the educative process. But for the child with warped personality, beatings from the parent are often succeeded by a succession of equally futile repressive measures in reform school, jail and penitentiary. What he needs is straightening out.

America's estimated $13,000,000,000 crime toll is the penalty paid by the community for harboring a small minority of untreated, chronically crooked personalities, declares Dr. Raymond B. Cattell, British psychologist, who was formerly psychotherapist in the School Psychological Clinic of Leicester.

"Whether it is the obsessional petty thief who works such havoc in the big 'chain' stores or criminals of world notoriety like Kürten, the Düsseldorf mass murderer, who had murdered two of his school-fellows by the age of eight, we clearly have to deal with a rooted abnormality of character which began in childhood and should have been treated in childhood," Dr. Cattell writes in *Crooked Personalities in Childhood and After.*

Mass hysteria, which has afflicted society as a whole from the days of the Crusades through epidemics of dancing mania, witch-hunts, and stock exchange excitement, demands medical treatment.

"Today Europe groans under a nightmare emotion of war fever and suspicion; and no one knows how to alleviate the vicious psychological circle of fear and aggression," writes Dr. Cattell.

Children need understanding and mental care during the formative years. Aid is needed again when the individual reaches the difficulties of adult life and marriage adjustment. Perhaps even more is psychic advice needed when we attain the difficult age of waning powers, retirement, and old age. Society must provide this aid and must eliminate superfluous stresses and strains such as overcrowding, poverty, and insecurity.

Science News Letter, September 10, 1938

INVENTION

New Type Traffic Light Changes Colors Gradually

A NEW TYPE of traffic light, with colors that fade gradually from one to the other instead of changing abruptly as in the familiar street standard, has been placed on exhibition at the New York Museum of Science and Industry.

Invented by 72-year-old Martinus Sieveking, a former concert pianist turned inventor, the new light is stated to be cheaper to construct than the more conventional signal. In addition, its inventor claims, its gradual change feature gives pedestrians and motorists a better warning of a change, enabling automobiles to stop gradually and pedestrians to know when traffic is about to move against them.

Mr. Sieveking estimates the cost of his lamp as but $25 as against the $200 cost for the average type of light. The device is of the rotary type, consisting of an outer metal shell with four windows. Inside the shell a glass drum, divided into eight sections of green, amber and red, continuously revolves, the colors dissolving smoothly into one another slowly and progressively. About 10 seconds are required to make the complete change from one color to another, although the mechanism may be set to afford longer intervals if desired.

Science News Letter, September 10, 1938

CONSERVATION

Improvements Need Not Be Ruinous, Rules Suggest

WITH A NEW public works program about to get under way, it is worth while taking a critical look at plans for some of the improvements that are intended at once to make our communities more livable and to give jobs to the unemployed. Too often, public improvements have been synonymous with wholesale destruction by grader and steamshovel.

Recently a group of European conservationists and landscape engineers got their heads together and drafted a set of rules to be consulted when waterside improvements are being made. Their suggestions are worth pinning on the walls of local public works committees—and pasting in field supervisors' hats:

1. Improvements should leave the landscape as nearly as possible in its original state, or at least able to return to that state very quickly.

2. River courses should be changed only when absolutely necessary; and then they should not be made rigidly straight, but laid out in gradual curves.

3. Islands, as ideal breeding places for wildlife, should not be destroyed or disturbed.

4. Streamside vegetation should be left undisturbed as far as possible. If a stream must be widened, the cut should be made on the side with the least timber.

5. When trees and shrubs must be removed, they should be replaced immediately, preferably with native species.

6. New banks on a cut should be of natural materials, such as sod, brush, and broken stone; concrete walls are to be avoided.

7. Natural lakes and ponds should not be drained or destroyed, and their shore vegetation should either be left undisturbed or restored to its natural state as quickly as possible.

8. Planners should carefully consider whether projected improvements will cause a lowering in the water table.

9. Bridges, dams, etc., should utilize local material as far as possible.

10. Long, straight lines in dikes, levees, etc., are to be avoided.

11. Drainage projects should spare trees and shrubbery.

12. Definite plans should be fully worked out before digging begins.

Science News Letter, September 10, 1938

ENGINEERING

Blowouts Blamed on Careless Parking

BETWEEN 60 and 70 per cent. of all four-ply passenger car tire failures may be attributed to one of the American driver's worst habits, jamming the tire against the curbstone through careless parking, research workers of the Fisk Tire Company report.

The danger, they declare, lies in subsequent blowouts of damaged tires, which may wreck a car and result in personal injuries and death. Such careless parking may also knock front wheels out of alignment.

Science News Letter, September 10, 1938

PALEONTOLOGY

New Fossil Ape Genus Found Near Vienna

FOSSIL bones of a kind of higher ape not hitherto known to science have been recently discovered in Austria near the village of Klein-Hadersdorf. They were in a stratum of miocene age, with an estimated antiquity of some 20 million years. Prof. Kurt Ehrenberg of the University of Vienna has named the new genus *Austriacopithecus*.

Science News Letter, September 10, 1938

ZERO TO EIGHTY

by Dr. E. F. Northrup

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ZOOLOGY

NATURE RAMBLINGS
by Frank Thone

Aquatic Altruist

BEAVER colonies now being planted in the West, as natural conservation engineers, have an earnest of success in the history of a colony started near New York City as far back as 1920, William H. Carr, director of the Bear Mountain Trailside Museums, suggests. (*Natural History,* Sept.)

Eighteen years ago, Mr. Carr relates, three pairs of beaver were released in Bear Mountain State Park, forty miles north of New York. During that time their numbers have increased a hundredfold. The number of colonies now is more than sixty, distributed over a thirty-mile radius. Some of the migrating animals even swam the Hudson at a point where it is more than a mile wide.

The beaver colonies have brought benefits to many other life-forms. Their ponds have been breeding grounds for fish as well as for the insects and water-animals that fish eat. Wood ducks, once listed as exceedingly scarce for the region, have now become common. Even the trees killed by flooding when the ponds were formed have benefited a rare form of wildlife, the pileated woodpecker.

The usefulness of a beaver pond does not end even when it is abandoned and the breaking of the dam permits it to drain. On the rich soil formed of its silty bottom, reeds, cattails, bushes, and eventually trees move in. Songbirds congregate in the lush thickets, and fur-bearers like muskrat, raccoon and skunk find them good feeding grounds. As the thickets grow, deer begin to appear. Mr. Carr considers himself justified in calling the beaver an altruist.

Science News Letter, September 10, 1938

No place in England is more than 70 miles from the sea.

AGRICULTURE

Legumes Like Lespedeza Mean Much to Agriculture

LEGUMES—lespedeza—forage crops—and a lot of other big words are meaning much to farmers these days when soil improvement is almost as important as crops.

Legumes have the happy faculty of enriching the soil on which they grow so far as nitrogen is concerned. They take nitrogen directly from the air and manufacture it into plant food, through a partnership arrangement with bacteria that live on their roots.

Alfalfa and red clover are the commoner legumes, but the vetches, field peas and the annual lespedezas are also important.

There are others that most people have never heard of. The agronomists and plant breeders have them tucked away in their experimental plots, testing them, seeing what they are good for. Some of them may be the legumes of the future, plants that will allow the farmer to get crops profitably from unpromising land.

One of the most intriguing is a kind of lespedeza that does not need to be planted each year. This perennial species, *Lespedeza sericea,* comes back year after year from the crown as in alfalfa. It is still somewhat of a novelty in spite of its introduction from China before the turn of the century. Although grown commercially, it is still something to show visiting agriculturalists at such places as the Tennessee Experiment Station or Arlington Experimental Farms near Washington.

Older stands grow tall and bushy. Hay can be cut from it two or three times a year. One fault is that it contains too much tannin, the stuff used for tanning leather, to please livestock too well, but when the plant is made into ensilage the tannin content is reduced so that stock eat it readily.

It produces lots of seed which is beginning to be used in poultry feeds. Better learn how to pronounce lespedeza.

Science News Letter, September 10, 1938

SEISMOLOGY

Philadelphia Earthquake Epicenter Near Trenton

EPICENTER has been determined for the light earthquakes that recently shook the Philadelphia region, by scientists of the U. S. Coast and Geodetic Survey, using data obtained by Science Service. Center of the disturbances was near Imlaytown, in the western end of Monmouth County, N. J., a little less than fifteen miles southeast of Trenton.

Locating the epicenter was more difficult than if the quakes had been at a much greater distance, but stronger, so that they would have registered on more instruments. As it was, the shocks were so mild that they left readable traces only on the seismographs at Fordham University, New York City, and at the Franklin Institute, in Philadelphia.

Science News Letter, September 10, 1938

Wood does not necessarily decay with age: fungus is the cause of decay.

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The Inside Story of Coca-Cola !

Does Coca-Cola contain a mysterious habit-forming drug? Why did the government bring charges against Coca-Cola under the Food and Drugs Act? Is there any important difference between Coca-Cola and cheaper beverages of the same type?

You'll find these questions answered in *Coca-Cola: The Great What-is-it,* a report on "Cola" type beverages published in the current (August) issue of *Consumers Union Reports,* monthly publication of Consumers Union of United States.

Worms are a standard ingredient of practically all brands of tomato catsup. And because they're present in such large quantities in most brands at least one state has had to set a legally permissible limit of worm fragments. You'll find proof of these facts in a report on government tests of 43 brands of catsup which also appears in the current issue of *Consumers Union Reports* and which names the brands. Other reports in this issue evaluate new cameras and other new camera equipment; and expose deceptions commonly practised in the marketing of fur coats.

Catsup with Worms !

Shampoos

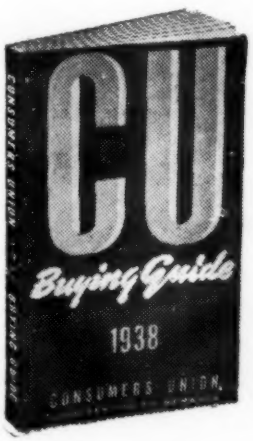
Heating Equipment

Children's Shoes

In the September issue you'll find reports on leading brands of SHAMPOOS, HEATING EQUIPMENT, CHILDREN'S SHOES, MEN'S SHIRTS, INFANTS' FOODS and other products. These reports will name names and will include ratings of brands for comparative merit as "Best Buys," "Also Acceptable," and "Not Acceptable." The report on HEATING EQUIPMENT is the first of two reports on this subject and will cover hot air furnaces and boilers. The second report, which will appear in October, will cover oil burners, coal stokers and other automatic heating equipment. The September issue will be ready for mailing in about ten days.

Going back an issue you'll find one of the most interesting and valuable reports Consumers Union has ever published. It's on cigarettes. It's based on smoking and chemical tests; it includes 35 brands; and it tells you whether Camels contain more nicotine than Chesterfields; how ten-cent cigarettes compare with fifteen-cent cigarettes; what is known about the effect of cigarette smoking on health; whether filter holders actually eliminate nicotine, and dozens of other things you've always wanted to know about cigarettes and about smoking.

35 Brands of Cigarettes



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•First Glances at New Books

Geology

OUR AMAZING EARTH—Carroll Lane Fenton—*Doubleday,* 346 p., illus., $4.50. Popular books on science usually suffer from one of two things: either they are produced by scientists who know their subjects but can't write well, or they are from the pens of professional writers who may be skilled in their craft but know science only out of books. Here, however, is a book by a skilled geologist who has spent many seasons out where the rocks and fossils are, and who can not only tell about it in simple and vivid language but can also make his own drawings. The result, as one might expect, is a mighty good book.

Science News Letter, September 10, 1938

Entomology

CHILDREN OF THE GOLDEN QUEEN—Flora McIntyre—*Dutton,* 80 p., $1.50. The life history of a bee colony, told in such a way as to interest small children, yet without sacrifice of essential accuracy. "Anthropopsyching", which ruins many nature books intended for children, is here carefully kept down to an unobjectionable minimum.

Science News Letter, September 10, 1938

Zoology

BIRDS AND MAMMALS OF MOUNT MCKINLEY NATIONAL PARK, ALASKA—Joseph S. Dixon—*Govt. Print. Off.,* 236 p., illus., 35 c. Third of the Fauna Series of the U. S. National Park Service publications, this bulletin describes fully and authoritatively the bird and mammal population of one of the remotest and therefore least disturbed of the national park areas.

Science News Letter, September 10, 1938

Metallurgy

MOLYBDENUM IN STEEL — *Climax Molybdenum Co., 500 Fifth Ave., New York City,* 13 sections and index, ring binder. A loose-leaf reference work on the uses and ways of using molybdenum as an alloying material for steel. Handy charts and graphs. It will be sent free to metallurgists and engineers who request it direct, under their business addresses.

Science News Letter, September 10, 1938

Seismology

EARTHQUAKES IN NORTHERN CALIFORNIA AND THE REGISTRATION OF EARTHQUAKES AT BERKELEY—MOUNT HAMILTON — PALO ALTO — SAN FRANCISCO—FERNDALE—FRESNO—Perry Byerly and John N. Adkins—*Univ. of Calif.,* No. 1, Jan. 1-March 31, 1937, 46 p.; No. 2, April 1-June 30, 1937, 50 p., each 50 c. Detailed data on shocks registered during two recent periods, constituting part of the most comprehensive study of seismological phenomena yet undertaken on this continent.

Science News Letter, September 10, 1938

Biography

AMERICA'S YOUNG MEN: The Official Who's Who Among the Young Men of the Nation. Vol. III, 1938-39—Durward Howes, ed.—*American Publications,* 655 p., $10. More than 6,500 biographies of outstanding men under forty years of age, with a geographical index, occupational index, and statistical summary make up this valuable reference book. Among the ten selected as most important in 1937 are: Ernest O. Lawrence, inventor of the "atom-smasher", Howard Hughes—and Edgar Bergen.

Science News Letter, September 10, 1938

Engineering

AIR CONDITIONING—Charles A. Fuller and David Snow—*Norman W. Henley,* 577 p., $4. A treatise covering fundamental theoretical and practical points of air conditioning engineering. Covers distribution, cooling, humidification, and purification in a wide variety of types of installations.

Science News Letter, September 10, 1938

Engineering

THE FRICTION OF AN OSCILLATING BEARING—A. Fogg and C. Jakeman—*British Library of Information,* 28 p., 30 c. Prepared by two British government scientists as a result of studies undertaken at Britain's National Physical Laboratory, an institution comparable to the National Bureau of Standards in this country.

Science News Letter, September 10, 1938

Photography

COLOR PHOTOGRAPHY FOR BEGINNERS—R. M. Fanstone—*Camera Craft Publishing Co.,* 136 p., $1.50. Even the beginner now has color photography within reach. This book describes clearly the process of taking and developing color pictures with either roll-film, miniature, or cut-film camera. The making of prints from color transparencies is not covered.

Science News Letter, September 10, 1938

Agriculture

REPORT ON THE AGRICULTURAL EXPERIMENT STATIONS, 1937—U. S. Office of Experiment Stations—*Govt. Print. Off.,* 226 p., 25 c.

Science News Letter, September 10, 1938

History

THE YANKEE CHEESE BOX—Robert Stanley McCordock—*Dorrance & Co.,* 470 p., $3. A history of the Monitor, John Ericsson's turreted iron vessel that met the threat of the Confederacy's ironclad Merrimack, and the vessel that did more to revolutionize the navies of the world than all other epoch-making ships put together. The history of this boat and its successor is told in greater detail than in any volume written in recent years. References to the controversy during the Civil War as to its actual worth are numerous and specific.

Science News Letter, September 10, 1938

Botany

TREES—John Y. Beaty—*M. A. Donohue,* 96 p., 66 illus., $1.50. About trees, all over the country, in the form of conversations with a couple of active-minded small boys who started asking questions about the trees they saw among the Lake Michigan dunes. The talk branches out from the trees themselves to the things they are used for, the animals that live in and among them, how trees get sick and can be taken care of, and a lot of other germane topics.

Science News Letter, September 10, 1938

Meteorology

SOME AMERICAN PAPERS AND NOTES ON CLIMATIC VARIATIONS: Report of the American Committee of the International Commission of Climatic Variations, to the International Geographical Congress, Amsterdam, Holland, July 1938—*American Meteorological Soc.,* 63 p., 50 c.

Science News Letter, September 10, 1938

Genetics

THE MEASUREMENT OF LINKAGE IN HEREDITY—K. Mather—*Chem. Pub. Co. of N. Y.,* 132 p., $1.75. A convenient little handbook for geneticists, giving the necessary formulae and manipulations for the statistical handling of that subject.

Science News Letter, September 10, 1938

Engineering

MEN AND OIL—Robert S. Weaver—*Univ. of Chicago,* 42 p., 25 c. A teaching aid to accompany an educational film.

Science News Letter, September 10, 1938

Psychology

CROOKED PERSONALITIES IN CHILDHOOD AND AFTER—Raymond B. Cattell—*Appleton-Century,* 215 p., $2. See page 172.

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